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Alexia Balland-Longeau

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MCKENNA LONG & ALDRIDGE LLP
1900 K STREET, NW
WASHINGTON, DC 20006

EXAMINER

HEINCER, LIAM J

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

DETAILED ACTION

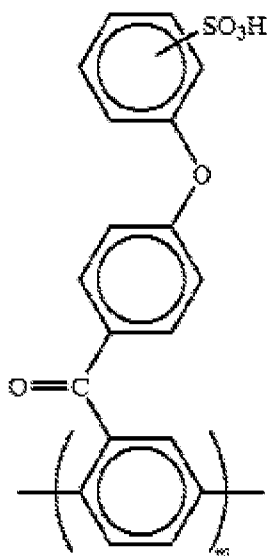
Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-5, 7, 8 and 12-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Asano et al. (US 2002/0172850) in view of Marrocco, III et al. (US Pat. 5,789,521).
Considering Claim 1, 3, 7, 8, and 15: Asano et al. teaches a polymer with a repeat unit of



(¶0033)

Asano et al. does not teach a repeat unit of formula II. However, Marrocco, III et al. teaches a copolymer (9:14-20) which consists of at least one repeat unit that is a poly-1,4-phenoxybenzoylphenylene (18:42-60)) at least one repeat unit that is a fluorinated (11:41-51) poly-1,4-benzoylphenylene (13:50-62). Asano et al. and Marrocco, III et al. are combinable as they are concerned with the same field of endeavor, namely phenylene polymers. It would have been obvious to a person having ordinary skill in the art at the time of the invention to have used the poly-1,4-benzoylphenylene repeat unit of Marrocco, III et al. in the polymer of Asano et al., and the motivation to do so would have been as Marrocco, III et al. suggests, to provide a greater solubility to the polyphenylene (11:5-23).

Considering Claims 2 and 14: Asano et al. teaches the molecular weight as being greater than 1,500 to 200,000 (¶0432).

Considering Claim 4: Asano et al. teaches a block copolymer (¶0434).

Considering Claim 5: Asano et al. teaches a two component copolymer where the sulphonated unit comprises 50 to 60 mol% of the polymer (¶0027).

Considering Claims 12 and 13: Asano et al. teaches the use of the polymer as membrane for use in a fuel cell (¶0002).

Claims 1-5, 7, 8 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marrocco, III et al. (US Pat. 5,789,521) in view of Charnock et al. (WO 01/70858).

Considering Claims 1, 3, 7, 8, and 15: Marrocco, III et al. teaches a copolymer (9:14-20) which consists of at least one repeat unit that is a poly-1,4-phenoxybenzoylphenylene (18:42-60)) at least one repeat unit that is a fluorinated (11:41-51) poly-1,4-benzoylphenylene (13:50-62).

Marrocco, III et al. does not teach the poly-1,4-phenoxybenzoylphenylene unit as having a one of the claimed constitutes on the pendent aryl group. However, Charnock et al. teaches sulfonating, phosphorylating, or carboxylating (5:5-10) a poly-1,4-phenoxybenzoylphenylene (3:20-22, Figure 3b). Marrocco, III et al. and Charnock et al. are combinable as they are concerned with the same field of endeavor, namely phenylene polymers. It would have been obvious to a person having ordinary skill in the art at the time of the invention to have sulfonated, phosphorylated, or carboxylated the poly-1,4-phenoxybenzoylphenylene repeat unit of Marrocco, III et al. as in Charnock et al., and the motivation to do so would have been, as Charnock et al. suggest, to provide ion exchange sites on the polymer (5:5-10).

Considering Claim 2: Marrocco, III et al. teaches the molecular weight as being greater than 50,000 (19:26-30).

Considering Claim 4: Marrocco, III et al. teaches the polymer as being random, block/alternating, or sequential (9:13-20).

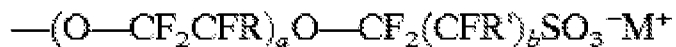
Considering Claim 5: Marrocco, III et al. teaches a head to tail, or head to head copolymer (9:13-20). Therefore there would be substantially the same mol% of each repeat unit/40 to 50 mol% of formula I and 60 to 50 mol% of formula II.

Claims 6, 9, and 10 rejected under 35 U.S.C. 103(a) as being unpatentable over Asano et al. (US 2002/0172850) in view of Marrocco, III et al. (US Pat. 5,789,521) as applied to claim 1 above, and further in view of Doyle et al. (US Pat. 6,025,092).

Considering Claims 6, 9, and 10: Asano et al. and Marrocco, III et al. collectively teach the polymer of claim 1 as shown above.

Asano et al. does not teach the pendant acid as being of the claimed type. However, Doyle et al. teaches using a pendant group of

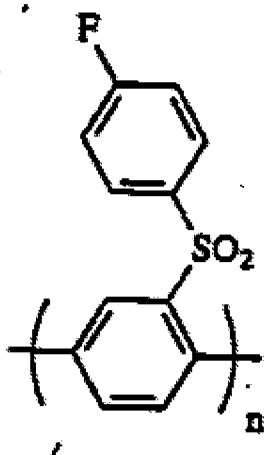
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in an ion exchange membrane (2:46-55). Asano et al. and Doyle et al. are combinable as they are concerned with the same field of endeavor, namely ion exchange membranes. It would have been obvious to a person having ordinary skill in the art at the time of the invention to have used the pendant group of Doyle et al. in the place of the sulphonic acid of Asano et al., and the motivation to do so would have been, as Asano et al. suggest, the excellent proton conductivity of the perfluorinated polymer electrolytes (¶0005).

Claims 1 and 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bloom et al., Functional Derivatives of Poly(4'-Fluoro-2,5-Diphenylsulfone via Nucleophilic Aromatic Substitution) in view of Charnock et al. (WO 01/70858).

Considering Claim 11: Bloom et al. teaches a process for producing a polymer comprising reacting a base polymer of



with a hydroxyl functional aromatic group (Scheme 1). Bloom et al. also teaches the aromatic group as containing functional groups to alter the properties of the base polymer (Conclusion). Bloom et al. teaches the substitute would be less than quantitative, thereby leaving units of the fluorinated precursor (Conclusion).

Bloom et al. does not teach the functional group as being one of the claimed acids. However, Charnock et al. teaches a sulfonated, phosphorylated, or carboxylated (5:5-10) poly-

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1,4-phenoxybenzoylphenylene (3:20-22, Figure 3b). Bloom et al. and Charnock et al. are combinable as they are concerned with the same field of endeavor, namely phenylene polymers. It would have been obvious to a person having ordinary skill in the art at the time of the invention to have sulfonated, phosphorylated, or carboxylated the polymer of Bloom et al. as in Charnock et al., and the motivation to do so would have been, as Charnock et al. suggest, to provide ion exchange sites on the polymer (5:5-10).

Response to Arguments

Applicant's arguments filed August 5, 2008 have been fully considered but they are not persuasive, because:

A) In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the motivation was provided in the last sentence of the first full paragraph on page 4 of the previous action. The cited motivation was "it would have been obvious to a person having ordinary skill in the art at the time of the invention to have used the poly-1,4-benzoylphenylene repeat unit of Marrocco, III et al. in the polymer of Asano et al., and the motivation to do so would have been as Marrocco, III et al. suggests, to provide a greater solubility to the polyphenylene (11:5-23)".

B) In response to applicant's argument that Asano et al. and Marrocco, III et al. are nonanalogous art, it has been held that a prior art references must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, Asano et al. and Marrocco, III et al. are analogous as they are concerned with the same field of endeavor, namely substituted poly-1,4-benzoylphenylene polymers. Although the end uses are different for each of the polymers, a person having ordinary skill in the art at the time of

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invention would have looked to other substituted poly-1,4-benzoylphenylene polymer references to make obvious improvements to the Asano et al. invention.

C) In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). While the applicant has cited limitations not taught by the Marrocco III, et al., Charnock et al., Doyle et al., and Bloom et al. references, they have not specifically pointed which limitations are not taught by the combination of references, or why the references cannot be properly combined.

D) Applicants argument that the combination of Bloom et al. and Charnock et al. do not teach the limitations claim 1 is not persuasive. All of the limitations of claim 1 are in fact addressed in the rejection above. As the applicant has not specifically stated which limitation they feel has not been addressed, the Office is unable to explicitly address any of the limitations in this portion of the action. Therefore the applicant is directed back to the rejection above.

Additionally, claim 11 is described as a “process for a polymer as claimed in claimed 1”. Therefore, if teaching all the limitations of the process steps would not in fact teach all the limitations of claim 1, the applicant has failed to claim essential elements of the claimed process. Should the applicant show that a person having ordinary skill in the art at the time of invention carrying out the claimed process would obtain a materially different product than that claimed in claim 1, claim 11 will be rejected for omitting essential elements.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

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CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Liam J. Heincer whose telephone number is 571-270-3297. The examiner can normally be reached on Monday thru Friday 7:30 to 5:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Eashoo can be reached on 571-272-1197. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Mark Eashoo/

Supervisory Patent Examiner, Art Unit 1796

LJH

October 31, 2008